Matters of Conceptualization and Security in the Building of One-stop-shop e-Government Solutions in Europe: Experiences from the European OneStopGov Project

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***Abstract*—From our experience gathered from OneStopGov as well as other e-Government research projects, we present matters of conceptualization of one-stop-shop e-Government solutions, focusing on ones that follow the life event approach. We look at the aspects that need to be considered regarding the public sector, who is the main target of e-Government solutions, we have a view of the market and finally we consider data privacy and safety issues that need to be taken into account.**

***Index Terms*—One-stop government, life event, portal, workflow**

I. Introduction

The OneStopGov project, funded by the European Commission through its IST Programme for research in the area of information and communication technologies, aims to specify, develop and evaluate a life-event oriented, integrated, interoperable platform for an all-inclusive one-stop government that is based on the concept of active life-event portals. This platform will be accompanied by a coherent framework for realising and exploiting online one-stop government at all levels (European, national, regional and local).

The guiding vision, challenge, innovation and unique selling proposition for the OneStopGov platform is the inherent support of life events at all stages.

Online one-stop government enables 24 hour, single point access to public services that are integrated around citizens needs (usually life events). Currently however, online one-stop government projects do not care about citizens needs and do not provide integrated services from different back-offices.

The OneStopGov project aims to specify, develop and evaluate a life-event oriented, integrated, interoperable platform for online one-stop government. This platform will be accompanied by a coherent framework for realizing and exploiting online one-stop government at all levels.

The guiding vision, challenge, innovation and unique selling proposition for the OneStopGov platform involve: the inherent support of life events; the active, citizen-centric approach; and the definition and use of generic models (e.g. generic workflows and generic reference models).

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II. The Market for Life Event Portals: Views of the Public Sector by 2020

In the Foresight 2020 report on "Economic, industry and corporate trends: A report from the Economist Intelligence Unit" which was sponsored by Cisco Systems [1], a separate chapter is dedicated to the public sector.

There, amongst others, the following is recognized:

The external environment: Public agencies will struggle with an array of profound challenges over the next 15 years, made worse by funding constraints and rising citizen expectations. Ageing populations and rising healthcare costs will feature among the greatest challenges.

The public-sector landscape: Budget constraints and swelling demand mean that agencies will be expected to do more with less. There will be greater emphasis on technology deployment, on performance management and measurement, and on outsourcing of non-core services as a result.

Changing relationships: Government services will be designed and delivered to meet the needs of citizens and businesses. Effective collaboration with other agencies and private-sector organizations will be critical in enabling public-service organisations both to deliver better service and control expenditure.

Agency strategies: There will be a significant decrease in the number of simple processes being conducted by humans, as e-government spreads. Public-sector organizations will place an increasingly high premium on recruiting, training and redeploying employees capable of sophisticated judgements and communication."

The above excerpt of the Economist report more than sufficiently covers the field of e-Government services and

infrastructures from an external party to the OneStopGov consortium. In order to facilitate the basic tendencies that are to be understood from the above, we come to the following – not exhaustive – list:

1) Public agencies will struggle with tougher funding constraints.
2) At the same moment, public agencies will struggle with rising citizen expectations
3) Public agencies will have to achieve more (for their citizens) with less (money).

How can this be achieved? Again, using the Economist 2020 Foresight we recognize that:

4) There will be greater emphasis on technology deployment, on performance management and measurement, and on outsourcing of non-core services as a result.

Or with other words, technology shall facilitate the rationalization of the – usually unnecessarily high - costs for delivering high quality services to the citizens. And also:

5) Government services will be designed and delivered to meet the needs of citizens and businesses.
6) Effective collaboration with other agencies and private-sector organizations will be critical in enabling public-service organizations both to deliver better service and control expenditure
7) There will be a significant decrease in the number of simple processes being conducted by humans, as egovernment spreads. Public-sector organisations will place an increasingly high premium on recruiting, training and redeploying employees capable of sophisticated judgements and communication

We shall build the entirety of our use plan and exploitation exercise throughout the OneStopGov project based on the above 7 business hypotheses. They can be regarded as same important as the requirements that are collected directly by the User partners of the project – while on the other hand not showing the shortsightedness that in many cases adheres the public sector officials1.

III. Overall addressed OneStopGov market structure, stratification and dynamics

Requirements for a single entrance point to public services and information is not a novel or recently identified need for public administrations as several surveys on e-Government initiatives in different countries have shown. However, the strategy of the majority of government organizations is “to be present on the world wide web” and only a few of them provide more advanced services and functionality.

[1] This can be grounded on collective common sense knowledge: not surprisingly, in Greece employee unions in the public sector continue to demand the creation of new (permanent as well!) employee positions while it is an obvious reality that the entirety of problems and shortcomings in the public sector in Greece does not relate with the lack of employees and staff but with several other organisational and technological lacks. Similar is the situation in Germany where the Big Alliance between the two biggest political parties has come to a dead end as the result of difficulties they face to implement radical reforms without harming the established set of workers’ rights.

Though we do not have evidence from a thorough investigation on this, it seems that organizations follow a learning process pattern. This means that those who had an earlier interest in the employment of Internet and achieved to create a critical mass of experiences together with a stable team of people involved in the design and management of these services, continue to do so and incrementally introduce new services or link the older ones with more functionality, new usage patterns etc.

For Greece only, the most factual case is this of the General Secretariat of Information Systems in the Ministry of Economy and Finance www.ggps.gr. This complies also with the results of the work of A. Schellong and D. Mans “Citizens preferences towards One-Stop Government”, of the Faculty of Social Sciences, Johann Wolfgang Goethe University Frankfurt am Main, Institute für Methodology - Qualitative Methods and Software Engineering, which presents the major results of a survey conducted in several German cities to assess preferences citizens have towards aspects of One-Stop Government. According to the authors, One Stop Government has a lot in common with the concept of collaborative CRM. Aspects that play an important role for its success are:

1) channel adoption and assignment,
2) collaborative data usage and privacy,
3) cost reduction potentials and
4) information policy (marketing) for egovernment services.

Their findings, held as part of the dg.o2004 Conference on Digital Government Research in May 24-26 2004 in Seattle, U.S.A., though dating back to 2002, support that citizens seem to be ready for transaction type public online services and new forms of service delivery but still recognize the need for more and continuous detailed research.

According to the Information and Communications Technology for Sustainable Development Report on Defining a Global Research Agenda [2], the main impediments relate with the 4 As namely to the lack of:

1) Awareness regarding existing / operational services and infrastructures as well as existing solutions and technologies capable to support organizations in improving their work patterns
2) Availability of solutions and services in terms of enabling an as much easy and straightforward uptake and adoption as possible
3) Accessibility regarding all involved parties, i.e. from the end users which need to be taken into account during the design of the applications and the user interfaces, to all involved parties such as data / service providers, designers of applications, commercial solution providers, etc.
4) Affordability of the provided services not only regarding the direct costs but the overall capability to master the service usage process, the existence of the necessary hardware and software, etc.

Reducing the divide, according to the same source, requires improvements across the following four C dimensions:

1) Computing in terms of systems, applications and services available for use and employment

2) Connectivity in terms of supported integration possibilities between different systems
3) Content which does not necessarily relate to rich content demands but even to simpler forms of content created and maintained by public authorities in terms of contacts databases, etc.
4) human Capacity in terms of users empowered to use the new infrastructures and services, in both phases and steps of the introduction of a new service or system.

Identification of all those parameters that might facilitate the adoption of the OneStopGov results by the participating countries and especially the User partners, would positively affect the uptake and adoption potential after the project completion.

Another trend that cannot be denied relates with the underlying business model – in many cases there is simply no business model at all behind a public authority's portal, in contrast to the commercial portals that rely heavily on advertising, which doesn't work well for informational websites, where users focus on content, not ads.

On the other hand, the ability to formulate new ventures with the participation of private investors is encouraging some public administrations to open (their minds and) their information repositories to the general public. For this speaks also the fact that advertising does work very well for search engines, however, because they are the only type of website that people visit to find someplace else to go. Thus Internet portals that originated as search engines have flush income streams today, while non-search portals quickly ran into trouble. While for the case of e-Government portals, we would expect them to be funded by productivity increases.

If they can enable the citizens to do their jobs more efficiently, then there are several and different types of gains for the public administrations which can be used by them to pay for the portal project. This element is extremely important and will be taken into account when we shall develop the OneStopGov business plan.

IV. Life event portals: a market not only for public administrations…

Life event portals, though in our context relate with the area of e-Government, can in general change our way of interacting with almost any type of enterprise entities.

A famous example of how the private sector can profit from commercializing the life-event concept is the site http://www.iammoving.com/ (previously known as www.Ihavemoved.com).

In this portal, people register their change of address and the owners notify all relevant agencies e.g. utilities, banks etc. In this way, the citizen does not have to communicate with each agency to change his address! This is a brilliant idea and actually free to citizens. The portal gets money from the participating agencies. The agencies save money by not sending letters to the wrong address.

The usage of "life event" like portal, like the iammoving.com, is based on the creation of the profile of the customer where all the information regarding the collaborating organizations/companies is recorded. The customer updates the profile in order the iammoving.com to have all the necessary information to inform the organizations about the customer movement. The iammoving.com verifies the information provided by the customer with the other organizations (like the bank or the IRS). When the customer changes address he/she changes the address to his profile. The iammoving.com undertakes the task of informing all the organizations about the new address of the customer.

There are cases where iammoving.com informs the customer if there are problems with the new address like failing to update the information to an organization repository reporting the reason (technical problems or unaccepted address).

In the same notion there are services where the customer with "one stop" can inform a number of services (like air ticket, hotel reservation, car reservation, etc) but without creating a profile.

The difference is that in this case is that the lack of a profile requires the customer to provide more information every time that he/she uses the service. In addition that is no automation and there can be no intelligence since there is no available information about the customer.

On the other hand this kind of portals either is not allowed to store personal information or they can not elaborate this information for a future use.

A typical paradigm is the e-travel agencies portals where the customer can arrange a set of service with "one stop" to the portal. The travel agency will undertake the task of arranging (in technical level execute a number of e-services) all tasks based on the customer requirements. Without the use of user profiles, the user is asked to provide all information (regarding the air ticket, the hotel reservation and the car rental).

A profile that would store information regarding the type of flight (business or economy) the hotel category and the car category would enable the system to propose a list of solutions.

Furthermore, in another context, we visit the Web site of a bank either for acquiring some information regarding their products (I want information on a bank's particular loan products), or for acquiring some information regarding a financial product I am currently 'using' (How can I improve my investment portfolio? Or my bond loan amortization? Etc.)

In this respect, the basic requirement is to profile an as representative as possible set of life events that shall enable people to fulfill their communication needs and service requirements.

For a Public Administration that has been receiving e.g. 3000 inquiries on a daily basis as it is the case of the Greek Ministry of Finance, a change of their portal to support immediate satisfaction of the top 1 (usually amounting up to 60% of the requests and an equally high amount of resources) is obviously essential and fully justifies the related costs for the development of such a service.

Of course, there are always special cases and in this respect

life event modeling has its limits. However, we have all been recipients of experiences in which an interaction dialogue with an e-commerce portal that we have been following for about ten minutes and during which we have provided several times personal data, lead to a dead end simply because our request was not part of the systems supported functionalities.

If you are for instance purchasing a book – not from amazon.com that takes care of this 'exception' but from a less well supported e-bookseller – and the address of shipping the books is different from the one that you stay, then you end up either not materializing the purchase, or by getting the books to the wrong place. But even for the case of amazon.com, there are always special cases that cannot be supported and for which you need the communication with some member of the staff (e.g. split the shipment of the order to different places or recipients etc.).

The critical point is to know where exactly the life-event modeling exercise should stop at. The question of how far one should go depends on several matters.

After visiting several sites of local authorities we found that:

There are differences in the look and feel and interaction styles, but in general these are not disabling for the users. Someone who can find his/her way when interacting with one site can similarly do so (with much or less success) with another.

However, most sites were providing their functionality neither from the user's perspective, as it would have been expected by the adoption of the life-event modeling approach, nor from some abstract perspective that might reflect the point of view of the particular authority's view on its business.

The reason for this relates to the way that public administrations organize their presence on the Web, which does not follow a coherent and consistent logic related with the needs of the users, but mainly with two approaches:

It either reflects the functions performed by the organizational chart of the particular authority. Or, alternatively, it reflects the organizational particularities of the authority. (No need to say that they are normally of no interest at all to the citizens who visit the site.)

V. Data Privacy and Safety issues

The issue of data privacy and safety is of special concern in Europe. The European Union (EU) has prepared a number of Acts, Directives and Regulations that the members of the EU have to follow and adapt in their legislation. OneStopGov will provide online government services, thus it is essential to be compliant with the legislation of the Public Authority's country where it will be adopted, and be able to ensure data privacy and safety issues for the citizen. Here we provide a brief overview of legislation framework that ensures the data privacy and safety of the European citizens. A growing number of the European Union's activities depend on the lawful use of personal data. Data protection is therefore an important requirement for their success. This legislation contains concerns regarding data privacy that should be taken into account for e-government systems such as the OneStopGov.

In the European legislation the privacy and data protection are two separate fundamental terms [3]:

1) Respect for private life was established in 1950 with the adoption of the European Convention of Human Rights - in the framework of the Council of Europe. Put in short terms, the right to privacy may be described as a right which prevents public authorities from measures which are privacy invasive, unless certain conditions have been met.
2) The right to data protection was introduced in the 1980s as a consequence of technical developments. Put in short terms, data protection principles aim to establish conditions under which it is legitimate and lawful to process personal data. Data protection legislation obliges those responsible to respect a set of rules and empowers the people concerned by granting them rights. Finally, it provides for supervision by independent authorities.

A. Basic rules on data protection

Today, at the EU-level, the basic rules on data protection are laid down in [4]:

1) Article 8 of the Charter of Fundamental Rights of the EU
2) Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data;
3) Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data.
4) Data Protection Act 2003
5) Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

1) Fundamental Rights (EC – 2000/C 364/01)

The chapter of fundamental rights of the European legislation (2000/C 364/01) is referred in general level about the protection of personal data:

1) Everyone has the right to the protection of personal data concerning him or her.
2) Such data must be processed fairly for specified purposes and on the basis of the consent of the person concerned or some other legitimate basis laid down by law. Everyone has the right of access to data which has been collected concerning him or her, and the right to have it rectified.
3) Compliance with these rules shall be subject to control by an independent authority

2) EU-Directive 95/46/EC

One of the most important regulations at the European, and even at a global, level is the EU-Directive 95/46/EC on the protection of individuals with regard to the processing of

personal data and on the free movement of such data. More specifically, this directive includes standards for data protection and privacy policy within the European Union on issues such as the "Right of access".

3) Regulation (EC) No 45/2001

The European Regulation No 45/2001 concerns the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. The Regulation refers to (Data Protection Officers, 2005) what is 'personal data' and 'processing of personal data', and who is the 'controller', 'recipients', 'processor' and 'third party' users of the personal data. Moreover, the Regulation specifies the how the personal data should be processed and collected

4) Data Protection Act 2003

An act that gave effect to the Directive 95/46/EC was the Data Protection Act of 2003 which amended the Data Protection Act of 1988. Some critical points of the new Act mention the following:

- General rules on the lawfulness of the processing of personal data
- Principles relating to Data Quality
- Criteria for making Data Processing Legitimate
- Processing of personal data and freedom of expression
- Information in cases of collection of data from the data subject
- Information where the data have not been obtained from the data subject
- Right of Access
- The data subject's right to object
- Confidentiality and Security of Processing
- Obligation to notify the supervisory authority
- Judicial remedies, liability and sanctions
- Transfer of personal data to third countries
- Supervisory authority and working party on the protection of individuals with regard to the processing of personal data

5) Directive 2002/58/EC

The Directive 2002/58/EC concerns the processing of personal data and the protection of privacy in the telecommunications sector and the processing of personal data and the protection of privacy in the electronic communications sector.

6) Establishment of a European supervisory authority

The European Union has established an independent supervisory body responsible for monitoring the application of Community acts relating to the protection of personal data in the Community institutions and bodies. The European Parliament and the Council adopted Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. The regulation establishes an independent supervisory authority, the European Supervisor, responsible for monitoring the processing of personal data by the Community institutions and bodies.

B. Legal issues and constraints on e-Government systems

Privacy has been identified as a double-sided issue in e-government systems [5]. On one side, secure systems are needed that can impede unauthorized access. On the other side, there is the issue of how to access personal data and other technical means to increase privacy. Through, for example, access to personal e-government files, a citizen can verify the use, authenticity and accuracy, of his or her own personal data, and as a result, achieve a higher and more informed level of privacy and trust in the systems. This can be made part of a strategy where e-government is used to empower the citizen.

It is a demand to give the citizens access to their own records. One of the reasons is that modern e-government is built around a "Service Oriented Architecture" where the legally defined "walls" around public units should be removed in order to ensure the flow of information. A central challenge is how the new technology can be used not only to increase efficiency for public administration, but also to strengthen privacy for the citizen by creating mutual transparency between public administration and citizens. Whether the technology enhances privacy or not, is largely dependent upon its specific implementation and the relevant legislation.

The goal of OneStopGov project is to develop a functional system allowing all citizens' access to public information and services, ranging from filling of different forms to processing them online. Any citizen must be able to access the Internet, from either home or a public place, for interacting with the administration. On the other hand, the legal obligations of the central and local public administration authorities that offer these public services should be defined by law.

Protection of personal data comprises organizational, technical and logical-technical procedures and measures to protect personal data, and to prevent accidental or deliberate unauthorized destruction, modification or loss of data, and unauthorized processing of such data by:

1) protecting premises, equipment and systems software, including input-output units;
2) protecting software applications used to process personal data;
3) preventing unauthorised access to personal data during transmission thereof, including transmission via telecommunications means and networks;
4) ensuring effective methods of blocking, destruction, erasure or anonymisation of personal data;
5) enabling subsequent determination of when individual personal data were entered into a filing system, used or otherwise processed, and who did so, for the period covered by statutory protection of the rights of an individual due to unauthorised supply or processing of personal data.

The European Data Protection Acts, 1988 and 2003 do not

detail specific security measures that a Data Controller or Data Processor must have in place. Rather section 2(1)(d) of the 1988 Act places an obligation on persons to have appropriate measures in place to prevent "unauthorised access to, or alteration, disclosure or destruction of, the data and against their accidental loss or destruction."

The European Data Protection (Amendment) Act, 2003, introduced a new section 2C into the 1988 Act. This section helps interpret the nature of security measures required to demonstrate compliance with 2(1)(d). When determining measures, a number of factors need be taken into account:

1) The state of technological development;
2) The cost of implementing measures;
3) The harm that might result from unauthorised of unlawful processing;
4) The nature of the data concerned;

A further development introduced by the 2003 Act is the obligation on data controllers and data processors to ensure that their staff are aware of security measures and comply with them. This guidance is purely intended as an indication of issues which data controllers and data processors may wish to consider when developing security policies.

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